BRITISH COLUMBIA
Ministry of Forests

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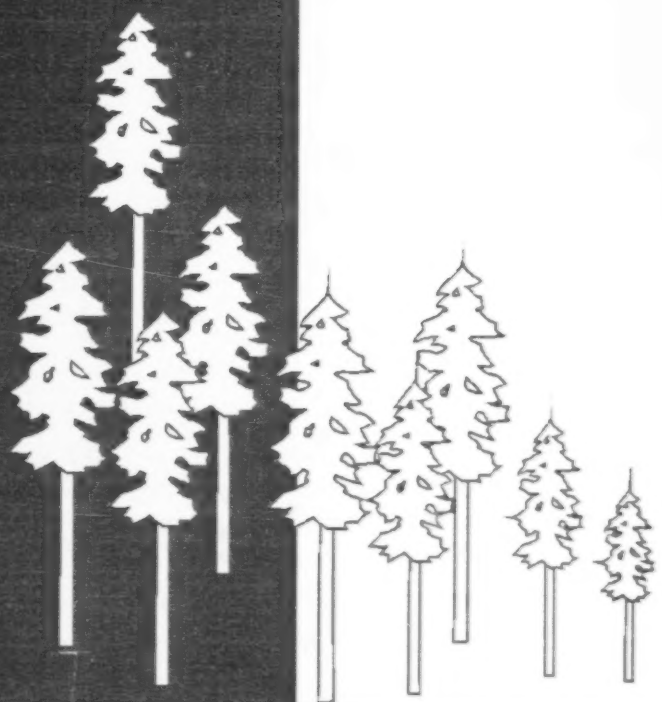
MINISTRY OF FORESTS

Beetle Salvage Timber

September 25, 2001



Revenue
Branch

Beetle Salvage Timber

Table of Contents

A. Issue 1
B. Introduction 1
C. Principles 2
D. Data Sources 2
E. Analysis 3
1. Overhead 3
2. Tree to Truck 3
3. Log Transportation (Hauling) 3
4. Road Maintenance 4
5. Silviculture 4
F. Other Salvage 4
1. Fire Salvage 4
2. Trap Tree Salvage 4
G. Conclusion 5
Appendix 1 Summary of Incremental * Unit Costs ($/m^3)
Appendix 2 Beetle Salvage Timber Cost Survey

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A. Issue

To establish special cost estimates for specified operations (Specified Operation Cost Estimate) for the salvage of small patches of timber under Section 4.1.1 Specified Operations of the *Interior Appraisal Manual*.

B. Introduction

An information paper was distributed to the Interior Appraisal Advisory Committee (IAAC) on February 21, 2001 advising licensees that a Beetle Salvage Timber Survey Cost Survey (Beetle Survey) would again be sent out for a 12 month period ending March 31, 2001. Due to the continued beetle infestation it was necessary to expand the scope of the Beetle Survey and to include all interior regions. Revenue Branch asked all major licensees to complete the Beetle Survey and also invited small business licensees to do likewise.

It was again considered necessary (because of different costs) to recognize two distinct operational strategies for beetle salvage that cost more than conventional harvesting:

1. Small Clear-Cuts (SCC) - which include beetle attacked and normal timber.

2. Small Patch Sanitation (SPS) – a form of partial cutting, which targets infested trees.

In addition to beetle salvage, Revenue Branch, established interior wide Specified Operation Cost Estimates for Fire Salvage and Trap Tree Salvage. There was no data readily available to consider Blowdown.

C. Principles

The same three principles (from the previous year) were used for determining Specified Operation Cost Estimates - for the salvage of small patches:

- The Specified Cost Estimates must be the incremental cost of harvesting beetle infested trees. No double counting is permitted.

- Audit-able costs must be used to derive the Specified Operation Cost Estimate.

- The objective of the exercise is 'cost neutrality' that is, the delivered appraised wood cost for salvaged wood (including stumpage) should be comparable to the delivered appraised wood cost (including stumpage) of normal green sawlogs.

D. Data Sources

The sources of data (used to determine the Specified Operation Cost Estimate) were as follows:

- A Beetle Survey was sent to all major licensees to be completed by June 15, 2001, and to small business licensees who were invited to participate. The Beetle Survey collected the total costs (for the latest 12-month period) for each salvage strategy, and specific operating activities to control/salvage bark beetle timber (see Appendix 2). Revenue Branch received 182 samples from major licensees, of which 149 samples (81%) were considered reasonable, by the regional audit accountant and used in the analyses. The 19% of the samples that were not used were considered either not audit-able or the assumptions were unreasonable. Prior to completing the analysis, we audited a random sample from each region. The total volume of cubic meters analysed in the Beetle Survey, from all regions, was 944,000 m^3 (Cariboo 85,477 m3, Kamloops 30,775 m^3, Nelson 24,955 m^3, Prince George 537,038 m^3, and Prince Rupert 265,755 m^3). The one cable sample was excluded from the data and a single horse sample was included in ground skidding. Of all the samples received 66% were small patch sanitation. There were also 21 samples from small business licensees; these samples were not included in the analyses as there was no comparable data in the Logging Survey, however the samples were compared to the results as part of our reasonableness testing.

- The 1999 Interior Logging Cost Survey (Logging Survey) was used to analyse; tree to truck, log transportation (hauling) and road maintenance. The Logging Survey is the 'cost base' for the July 1, 2001 *Interior Appraisal Manual* (Manual).

E. Analysis

This year, unlike the previous year, we collected survey data from all regions within the interior, and as a result were able to determine a regional estimate for each of the phases or categories.

The Specified Operation Cost Estimates cover five separate categories: overhead, tree to truck, log transportation (hauling), road maintenance and silviculture; and unlike the previous year, all phases estimates, except for silviculture, were combined into a single regional SPS or SCC estimate (see Appendix 1).

1. Overhead

The overhead costs for; beetle detection, planning, field-layout, probing, baiting and tree marking were identified for each region within the Beetle Survey. Unit costs were determined from the Beetle Survey and reduced by the amount already included in the Manual for beetle overhead. The harvest volume (m^3) for beetle salvage is not available in the Logging Survey, however we can determine (for each region) an amount that was included in overhead costs, and by using the volumes from the Beetle Survey, we have calculated a unit cost for each region in the Manual. The difference between the unit cost determined from the Beetle Survey, and the calculated unit cost from the Manual represents the overhead portion of the Specified Operation Cost Estimate.

2. Tree to Truck

The 'tree to truck portion' of the Specified Operation Cost Estimate was determined by comparing (for each region) the unit costs of the Beetle Survey to the Logging Survey. The Beetle Survey was analysed by method (ground skidding and helicopter) and category (SPS and SCC). The Logging Survey was analysed by method (ground skidding and helicopter) using the harvest volume weighted average. The difference between the unit cost of the Beetle Survey and the Logging Survey represents the tree to truck portion of the Specified Operation Cost Estimate.

3. Log Transportation (Hauling)

The average (volume weighted) hauling unit cost from the Beetle Survey was compared to the average (volume weighted) hauling unit cost (both highway and off-highway) from the Logging Survey and summarised on a regional basis. The comparisons represent the hauling portion of the Specified Operation Cost Estimate.

4. Road Maintenance

The average (volume weighted) unit cost for road maintenance from the Beetle Survey was compared to the average (volume weighted) unit cost for road maintenance from the Logging Survey and summarised on a regional basis. The comparisons represent the road maintenance portion of the Specified Operation Cost Estimate.

5. Silviculture

Previously an incremental silviculture cost estimate was applied through an addition of 0.15 to the "R" factor for appraisal for SCC situations only. The rationale at the time, being that those SPS situations were less than a hectare in size and did not carry a silviculture liability for the licensee. Discussions with IAAC and evolutions in the strategies to combat the beetle epidemic have shown that what starts out as SPS less than a hectare more than likely ends up larger the following year. A decision was made to include the same incremental silviculture adjustment for SPS as with SCC providing that the District Manager required normal silviculture responsibilities on the part of the licensee.

F. Other Salvage

To improve the Specified Operation Cost Estimates from last year, two other types of salvage have been addressed:

1. Fire Salvage

The average unit costs for fire salvage were compared to the average unit costs of normal harvesting in the Logging Survey and sumarized by ground skidding and cable harvest methods. The comparison represents the Specified Operation Cost Estimate (all regions) for fire salvage for each of the two harvest methods.

2. Trap Tree Salvage

The average unit costs for trap tree salvage were collected in the Logging Survey (these samples are not included in the cost base of the Manual) and were compared to the average costs for normal harvesting methods (ground skidding, cable, and helicopter harvest) in the cost base of the Manual. This comparison generated an interim Specified Operation Cost Estimate, to which was added an incremental overhead component of $6.88 (SPS) from the Beetle Survey to arrive at the Specified Operation Cost Estimate (all regions) for trap tree salvage for each of the three harvest methods.

G. Conclusion

The general quality of the data collected in the latest Beetle Survey (i.e., the number of samples, the volume of cubic meters, and the extended regional coverage) were all significantly better than that of the previous year's survey.

Most licensees gave their best efforts to complete the Beetle Survey; some licensees produced detailed working papers supported by solid assumptions, while other licensees submitted insufficient details, and their data required additional testing. Unfortunately, some of the data collected was excluded from the analysis as it was deemed to be unusable, and other licensees did not submit data for various reasons.

The data used in the analyses was not weighted equally for each region, and there was bias in the Beetle Survey data - as we were unable to confirm that all relevant samples were collected. Nevertheless, the Beetle Survey was sent to all licensees, and each licensee had equal opportunity to submit and support their costs with reasonable assumptions.

In our opinion, except for the inherent limitations of using unit costs, the process was applied fairly to all licensees, and the results, based upon the licensees own evidence, was therefore considered reasonable.

Appendix 1

Ministry of Forests
Beetle Salvage Timber
Summary of Incremental * Unit Costs ($/m3).

Region	Category	Administration (Overhead)			Log Transportation (Hauling)			Road Maintenance			Logging (Tree to Truck)				Total
		Beetle	IAM	Difference	Beetle	IAM	Difference	Beetle	IAM	Difference	Method	Beetle	IAM	Difference	
Ca	SCC	2.35	0.47	1.88	7.09	9.26	(2.17)	1.10	1.04	0.06	Gs	17.26	18.51	(1.25)	(1.48)
											Heli	66.25	67.57	(1.32)	(1.55)
	SPS	8.29	0.47	7.82	6.77	9.26	(2.49)	1.65	1.04	0.61	Gs	22.16	18.51	3.65	**9.59**
											Heli	92.91	67.57	25.34	31.28
Ka	SCC	-	0.03	(0.03)	11.07	9.06	2.01	1.88	1.83	0.05	Gs	14.89	17.19	(2.30)	(0.27)
	SPS	3.08	0.03	3.05	9.62	9.06	0.56	1.70	1.83	(0.13)	Gs	17.46	17.19	0.27	**3.75**
Ne	SCC	1.96	0.02	1.94	10.45	9.03	1.42	1.88	2.61	(0.73)	Gs	28.47	22.10	6.37	**9.00**
	SPS	4.56	0.02	4.54	7.72	9.03	(1.31)	1.78	2.61	(0.83)	Gs	29.77	22.10	7.67	**10.07**
PG	SCC	8.05	0.09	7.96	9.30	7.02	2.28	1.87	1.90	(0.03)	Gs	17.26	16.65	0.61	**10.82**
	SPS	7.55	0.09	7.46	8.86	7.02	1.84	1.75	1.90	(0.15)	Gs	23.44	16.65	6.79	**15.94**
											Heli	88.53	62.52	26.01	35.16
PR	SCC	6.76	0.25	6.51	6.05	8.51	(2.46)	1.14	1.82	(0.68)	Gs	22.94	16.00	6.94	**10.31**
	SPS	6.67	0.25	6.42	7.95	8.51	(0.56)	2.80	1.82	0.98	Gs	23.41	16.00	7.41	**14.25**
Interior	SCC	6.39	0.16	6.23	8.71	8.47	0.24	1.62	1.80	(0.18)	Gs	17.88	18.00	(0.12)	6.17
											Heli	66.25	63.68	2.57	8.86
	SPS	7.04	0.16	**6.88**	8.44	8.47	(0.03)	2.18	1.80	0.38	Gs	23.34	18.00	5.34	12.57
											Heli	89.58	63.68	25.90	**33.13**

* Incremental - refers to the cost ($/m3) difference between the Beetle Survey and the 1999 Cost Base - used in the Interior Appraisal Manual (IAM) dated July 1, 2001.
Amounts in bold can be specifically identified / traced to Specified Operation Cost Estimates.

Prepared by Revenue Branch, Ministry of Forests (September 2001)

Appendix 2

April 18, 2001

Beetle Salvage Timber
Cost Survey
(Salvage of Small Patches of Timber)
2000 – 2001

Introduction:

The objective of this survey is to capture separately the total costs relating to specific operational strategies that control bark beetle infested timber. The two strategies are:

(1) Small Patch Sanitation (SPS) - those cutting authorities with individual patches of <500 m3 and <1 ha patches.

(2) Small Clear Cuts (SCC) - those cutting authorities with individual patches of <2000 m3 and <5 ha patches.

It's important (whenever possible) to report the total costs for (SPS) separate from the total costs of (SCC).

Activities to be reported include specific overheads, tree to truck activities, log hauling, and road management. The specific overhead and road management costs must be reported on a fiscal year basis. Logging costs (tree to truck and log hauling) must be reported for the current 12-month operating period (ending March 31, 2001) by Cutting Permit (or by TSL for those authorities without cutting permits).

Important Note:

All costs and data reported must be directly attributable to SPS or SCC cutting authorities. Where costs are incurred jointly for other purposes (normal logging over 5 ha) an allocation of these costs must be made on a reasonable basis (allocation assumptions must be fully documented, and working papers available for audit purposes).

The data collected in the survey is for the sole purpose of improving the cost estimates relating to the specified operations for the salvage of small patches of timber dispersed over a large area, under section 4.1.1 of the *Interior Appraisal Manual*. All of the data supplied is strictly confidential and protected against disclosure under provisions of the *Forest Act* and the *Freedom of Information and Protection of Privacy Act*. Upon completion of the survey, please return it (sealed envelope, marked CONFIDENTIAL) to the audit accountant in your region.

Information contained in this survey is subject to Audit by the Ministry of Forests.

April 18, 2001

Beetle Salvage Timber
Cost Survey
(Salvage of Small Patches of Timber)
2000 – 2001

SUMMARY PAGE
(For each Cutting Permit or TSL.)

Identification:

Licensee (Name): _____
Mill #_____ Mill Location: _____
Address: _____
Contact Person: _____
Phone / Fax/ E-Mail: _____

Information:

Region: _____ TSA: _____
District: _____(in which harvest occurs)
Geographic Location: _____ Supply Block: _____
Licence: (all types): _____
Cutting Permit: _____ Timber Mark: _____
Cut-Block: _____

Site and Harvest:

Average Slope: _____% Average Skid/Yarding distance: _____
Partial Cut: _____% (removed) Partial Cut: _____ Volume (m3) (Note: 'Partial Cut' is defined in the *Interior Appraisal Manual* as less then 90% volume removed)

Type of Insect Infestation: _____

Summary Table

Phase of Operation	Performed: Contractor (C) or by Licensee (L)	Total Costs of Section
From Section 1 – Harvested Volume - Total Volume (m3)		(m3)
From section 2 – Administration - Total Costs		$
From section 3 – Logging - Total Costs		$
From section 4 – Log Hauling - Total Costs		$
From section 5 – Road Management - Total Costs		$
TOTAL AMOUNT		$

Certification:

I certify that to the best of my knowledge, the information contained in this survey is correct and has been completed in accordance with the survey instructions.

Signing Officer- (signature): _____Date: _____
(Must be a Corporate Signing Officer)
Print Name and Position: _____ _____

April 18, 2001

Beetle Salvage Timber
Cost Survey
(Salvage of Small Patches of Timber)
2000 – 2001

Section 1 – Harvested Volumes: **Total Volume Section 1:** _____ **(m3)**

Enter the total volume of timber harvested (all grades) by a contractor or by the licensee.

Section 2 - Administration Costs:

Total Costs Section 2, (a & b): $_____

The specific overheads are

a) Include all costs for beetle detection, planning, field-layout, probing and baiting. $_____
b) Tree marking. $_____

Fall and Burn $ _____(for information only, do not include in total costs above).

Other Direct related beetle costs not specifically included above, please specify below:
$ _____(for information only, do not include in total costs above).

Section 3 - Logging Costs:

Total Costs Section 3, (Items 1 & 2): $_____

Tree to Truck – Description -

Includes all actual costs incurred in: (a) felling, skidding, yarding, bucking, sorting and loading timber (b) construction and rehabilitation of skid trails and landings (c) crew transportation and accommodation, and (d) other specifics costs such as fireguards, three-metre knockdown, slashing.

(Note hauling, road management and road construction costs must be excluded from the tree to truck costs or any 'stump to dump' contract).

The tree to truck sample should be for 100% of one of the below harvesting methods, and should not include prorates of another harvesting system.

Harvesting Methods and Volumes:

a) Ground Skidding Volume: (m3) _____
b) Cable Yarding Volume (m3) _____
c) Helicopter Logging (m3) _____
d) Horse Logging (m3) _____
Total Volume (a) to (d) (m3) _____(all grades)

SPS Volume (m3)_____
SCC Volume (m3)_____

1. Tree to Truck - Contract Logging Item 1: $ _____

If a logging contractor performed the tree to truck services enter the amount paid above.

2. Tree to Truck – By the Licensee Item 2: $_____

(Usually only small operators will completes item 2)

If the licensee performed the tree to truck work, then use a separate work sheet (attach a copy to the survey) to ensure that all appropriate costs are listed and can be audited. And, if required, use Appendix 1 (equipment and labour rates) from *the Interior Appraisal Manual*, for your equipment and labour rates; personal time (for small operators) can use $33.00 per hour. (Note: depreciation for all owned or leased equipment must be excluded from the tree to truck costs).

Beetle Salvage Timber
Cost Survey
(Salvage of Small Patches of Timber)
2000 – 2001

Section 4 - Log Transportation: **Total Cost Section 4: $_____**

Covers the aspects of log movement from the place of initial loading to the place of unloading as per the hauling contracts.

Log Hauling:

If the logs are hauled to different destinations we require separate samples for each destination.

a) Point of Appraisal _____

b) Destination (logs are hauled to) _____

c) One-way hauling distance (km): _____

d) Cycle time/round trip (0.1/ hour) _____

e) Total volume (m^3) hauled: _____

f) Hauling rate paid ($/$m^3$): _____

Total log hauling cost (e) times (f): $ _____ (to total cost above)

Section 5 - Road Management Costs: **Total Costs Section 5, (Items 1 & 2): $_____**

Includes all the costs of road maintenance, road deactivation and road rehabilitation as detailed:
Road maintenance includes: grading, snowploughing, sanding and spot gravel, culvert and repair, road side treatments, grass seeding, brushing, sign maintenance, dust control, non-structural maintenance of bridges, decking, minor flood and storm damage repair, removal and replace culverts less than 950 mm in diameter, slough removal, ditching, waterbar and cross ditch construction, road ripping, seasonal and final erosion control, road use charges and avalanche control. Road deactivation is the costs of rendering a road impassable to vehicles and included the following: bridge and culvert removals, pull back unstable sidecast or road fills, cut /fill slope stabilization, recontouring and deep fill removal. Road rehabilitation included the costs to restore the soil and site to a stable condition - this is not silviculture.

1. Road Management - Contract Total of Item 1: $_____

If contractors performed all of the road management enter the total amount paid to contractors in item 1 above.

2. Road Management: - By the Licensee Total of Item 2: $_____

(Usually only 'small operators' will complete item 2)

Use a separate worksheet (and attach a copy to the survey) to ensure that all appropriate costs are listed, and can be audited. If the licensee performed all or part of road management with owned equipment, use Appendix 1 (equipment and labour rates) from *the Interior Appraisal Manual*, for equipment and labour rates, for personal time (small operators only) use $33.00 per hour. Enter the total amount incurred (from your separate worksheet) to item 2 above.